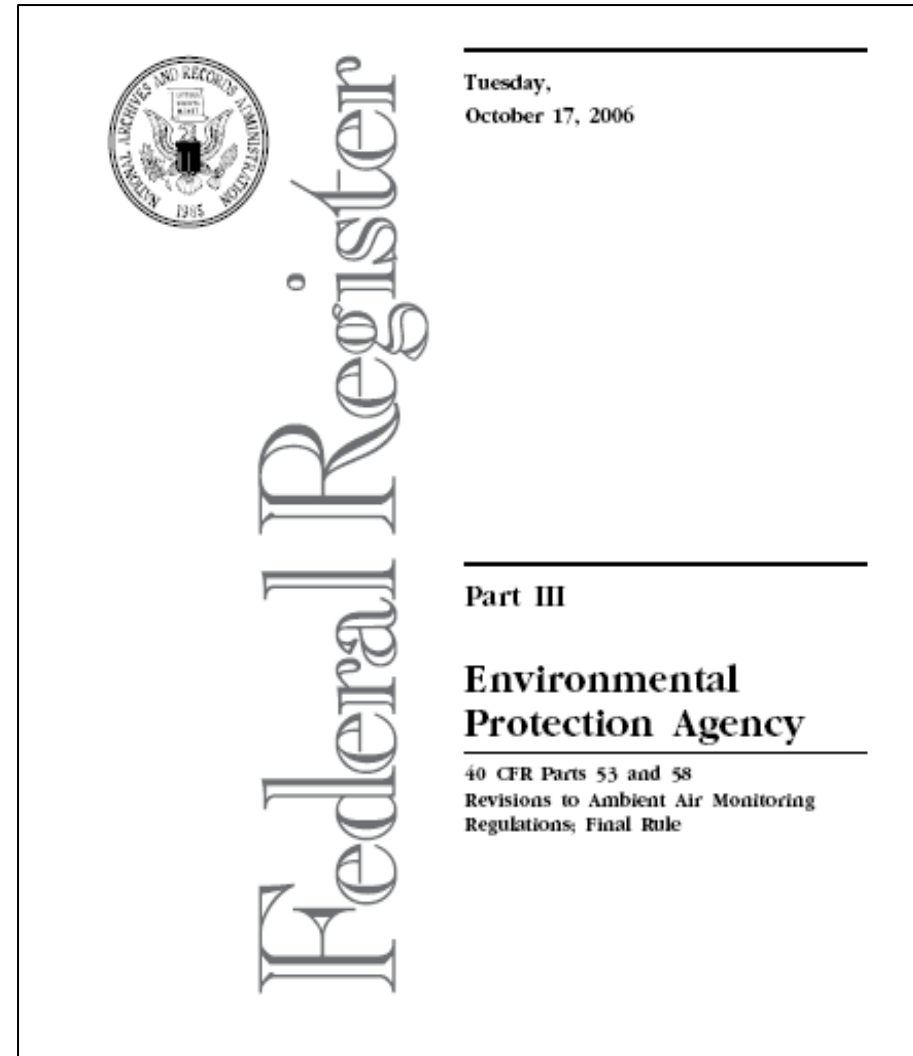


# Revisions to the Ambient Monitoring Regulations



## Overview of the Final Rule

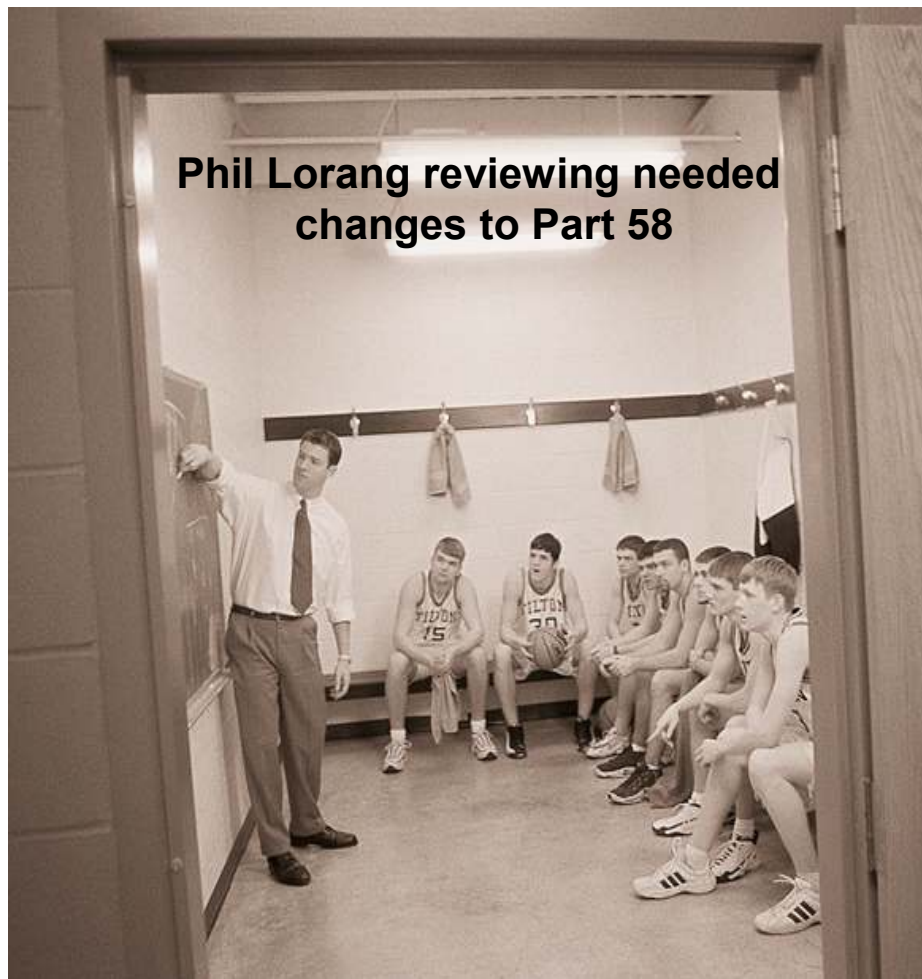
## Overview of NAAQS Decision

- On September 21, 2006 EPA completed its review of the National Ambient Air Quality Standards (NAAQS) for particle pollution.
- The final rule addresses two categories of particle pollution:
  - *fine particles* (PM<sub>2.5</sub>), which are 2.5 micrometers in diameter and smaller; and
  - *inhalable coarse particles*, which are larger than 2.5 micrometers and smaller than 10 micrometers in diameter.
- In the final rule EPA :
  - revised the fine particle standards to better protect public health and visibility, and
  - retained the 24-hour PM<sub>10</sub> standard to protect against exposure to inhalable coarse particles.
- For more information go to <http://www.epa.gov/air/particles>

## *EPA's PM Standards: Old and New*

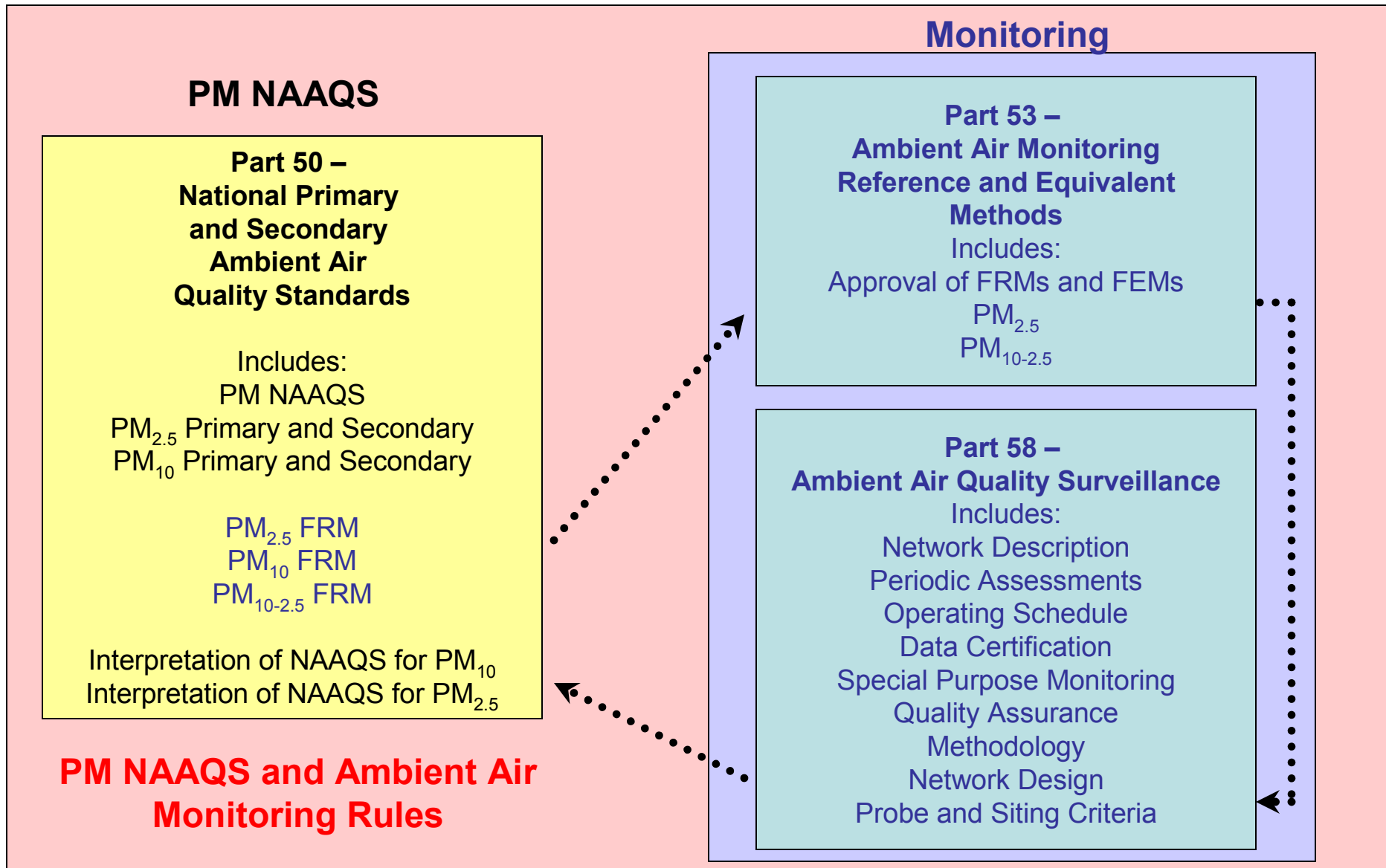
	Previous Standards		2006 Standards	
	Annual	24-hour	Annual	24-hour
<b>PM<sub>2.5</sub></b> <b>(Fine Particles)</b>	<b>15 µg/m<sup>3</sup></b> Annual arithmetic mean, averaged over 3 years (established in 1997)	<b>65 µg/m<sup>3</sup></b> 24- hour average, 98 <sup>th</sup> percentile, averaged over 3 years (established in 1997)	<b>15 µg/m<sup>3</sup></b> Annual arithmetic mean, averaged over 3 years	<b>35 µg/m<sup>3</sup></b> 24- hour average, 98 <sup>th</sup> percentile, averaged over 3 years
<b>PM<sub>10</sub></b> <b>(Coarse Particles)</b>	<b>50 µg/m<sup>3</sup></b> Annual average (established in 1987)	<b>150 µg/m<sup>3</sup></b> 24-hr average, not to be exceeded more than once per year on average over a three year period (established in 1987)	<b>Revoked</b>	<b>150 µg/m<sup>3</sup></b> 24-hr average, not to be exceeded more than once per year on average over a three year period

## *The Monitoring Rule Team*



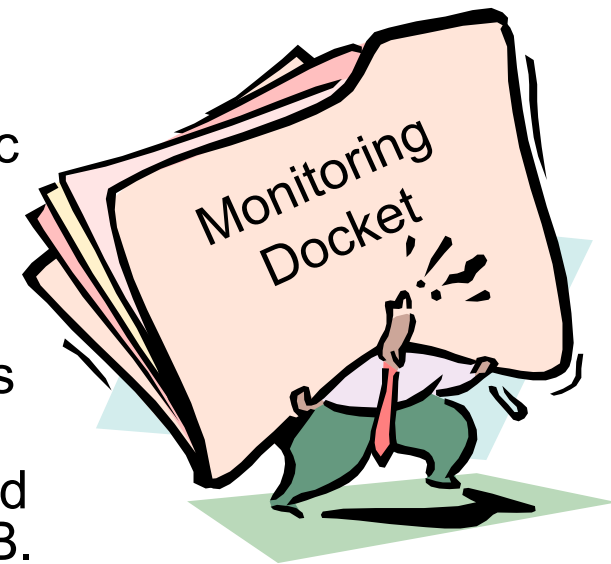
- OAQPS (Tom Curran)
  - Phil Lorang
  - Tim Hanley
  - Lewis Weinstock
  - Mike Papp
  - Kevin Cavender
  - Brenda Millar
  - Mark Schmidt
- ORD
  - Bob Vanderpool
    - Frank McElroy (RTI)
- OGC
- Regional Input coordinated through Region 4.
- Interagency review through OPEI (EPA's Office of Policy, Economics, and Innovation).
- OMB

## *How the Pieces Fit Together*



## ***A Look at the Comment Response Effort***

- Hundreds of individual citizen letters and several mass mailings.
- Detailed comment letters were received from State & Local Agency representatives (51), Tribes (53), Environmental, Health, and Public Interest groups (31), and Industry.
- All comment letters were read by staff.
- Discussions with management were held throughout the summer to consider comments and possible changes in the proposal.
- Draft responses were developed and reviewed by the Monitoring Rule Team, OGC, and OMB.
- Final Response to Comments (RTC) document (289 pages) posted in docket, EPA-HQ-OAR-2004-0018-668.



<http://www.regulations.gov/>

***Virtually every part of the monitoring proposal  
received some comment.***

## ***Major Rule Changes Due to Comments (1 of 2)***

- Strengthened field testing requirements for approval of Federal equivalent methods (tightened acceptance criteria, added fourth test site).
- NCore monitoring requirements (reduced PM<sub>10-2.5</sub> sampling frequency to 1-in-3 day from daily, NO<sub>y</sub> measurements can be waived).
- Eliminated PM<sub>10-2.5</sub> siting requirements (population based) and five-part suitability tests in support of qualified PM<sub>10-2.5</sub> indicator (PM<sub>10-2.5</sub> NAAQS not adopted).
- Additional PM<sub>2.5</sub> and ozone monitors required in more polluted areas, and more monitors in CSA's (compared with proposed requirements).
- Required daily sampling frequency at about 50 design value PM<sub>2.5</sub> sites recording values near the 24-hour NAAQS (35 µg/m<sup>3</sup>).

## ***Major Rule Changes Due to Comments (2 of 2)***

- Reduced PM<sub>10</sub> high volume and TSP flowrate verification frequencies from monthly to quarterly.
- Waiver for SPM quality assurance requirements when logistically infeasible and not essential to meeting monitoring objectives.
- Delayed deadlines
  - Accelerated data certification (2010 versus 2009).
  - First 5-year network assessment (2010 versus 2009).
- Increased roadway setback distance for ozone sites applies to new sites only.
- Reduced required elements of annual monitoring network plan.



## *Other Rule Changes*

- Required PM<sub>10-2.5</sub> speciation at all NCore sites instead of in 25 areas with MSA populations over 500k and high estimated design values (Interagency Review).
- Retention of existing PM<sub>10</sub> minimum monitoring requirements instead of proposed revocation of most requirements (PM<sub>10</sub> NAAQS decision).

## ***Known Errata Issues the Monitoring Rule***

- Due to the Federal Register print process
  - Missing merged cell in last row of Table C-4 to Subpart C of Part 53 (Test Specifications) – 71 FR 61286.
  - A few missing characters in appendix A of part 58.
- Editorial problems (need to consult with management and OGC).
  - §53.35 (c) – Test procedures for Class II and III methods for PM<sub>2.5</sub> and PM<sub>10-2.5</sub>. “All reference method samplers shall be of single-filter design (not multi-filter, sequential sample design).” May not reflect OAQPS position.
  - §58.20 (c) – “....or an approved alternative,....” wording needs to be stricken from rule language on SPM’s. Inconsistent with preamble.



**Please contact Lewis Weinstock with other known or suspected errata in the monitoring rule:**  
**[Weinstock.lewis@epa.gov](mailto:Weinstock.lewis@epa.gov)**  
**919-541-3661**  
**by November 17, 2006**

# PM Methods

# *Federal Reference Method Updates*

- EPA has finalized PM<sub>2.5</sub> FRM improvements
  - Incorporation of changes to improve efficiency of monitoring network operations.
- EPA has finalized PM<sub>10-2.5</sub> FRM
  - Two concurrently operated low-volume samplers with one measuring PM<sub>10</sub> and the other PM<sub>2.5</sub>.

*§ 50.13 National primary and secondary ambient air quality standards for PM<sub>2.5</sub>. (a) The national primary and secondary ambient air quality standards for particulate matter are 15.0 micrograms per cubic meter (µg/m<sup>3</sup>) annual arithmetic mean concentration, and 35 µg/m<sup>3</sup> 24-hour average concentration measured in the ambient air as PM<sub>2.5</sub> (particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers) by either:*

*(1) **A reference method based on appendix L of this part** and designated in accordance with part 53 of this chapter; or (2) **An equivalent method** designated in accordance with part 53 of this chapter.*

## *New Procedures for Approval of Federal Equivalent Methods ( $PM_{2.5}$ and $PM_{10-2.5}$ )*

- Federal Equivalent Method's for both  $PM_{2.5}$  and  $PM_{10-2.5}$ 
  - Defined three classes of equivalent methods with different testing requirements.
    - Class I - based on a sampler that is **very similar to the sampler specified for reference methods** in appendix L or appendix O (as applicable) of part 50 of this chapter, with only **minor deviations or modifications**, as determined by EPA.
    - Class II - utilizes a sampler in which integrated samples are obtained from the atmosphere by **filtration** and subjected to a subsequent filter conditioning process followed by a **gravimetric mass determination**, but which is not a Class I equivalent method because of **substantial deviations** from the design specifications of the sampler. **(process for approving dichotomous samplers)**
    - Class III - analyzer capable of providing ambient air measurements representative of **one-hour or less** integrated  $PM_{2.5}$  or  $PM_{10-2.5}$  concentrations as well as 24-hour measurements determined as, or equivalent to, the mean of 24 one-hour consecutive measurements. **(process for approving continuous samplers)**
  - Candidate Class II and III samplers must demonstrate statistical comparability with FRM samplers through field testing at a specified combination of test sites and seasons to be approved as FEM's.

## ***New Methodological Option: Approved Regional Methods (ARMs) for PM<sub>2.5</sub>***

- A PM<sub>2.5</sub> continuous method approved for use within a State, local, or Tribal agency used to meet multiple monitoring objectives such as NAAQS, Air Quality Index, and forecast validation.
- Allows agencies to optimize their PM<sub>2.5</sub> network with well performing (and currently deployed) continuous methods that may not perform well in all required FEM testing regions.
- Testing Criteria
  - Uses basically the same performance criteria as Class III methods.
  - Testing occurs at subset of sites in the network within which it's intended to be used.
- Approvals
  - Initial ARM application approved through Office of Research & Development.
  - Subsequent applications for method in another agency's network approved by EPA Regional Office.
  - All procedures (including proposed use of data transformations) must be fully described in Quality Assurance Program Plan accompanying ARM application.

# Minimum Monitoring Network Requirements

## ***PM<sub>2.5</sub> Minimum Monitoring Network Requirements***

<b>MSA Population<sup>1,2</sup></b>	<b>Most recent 3-year design value <math>\geq</math> 85% of any PM<sub>2.5</sub> NAAQS<sup>3</sup></b>	<b>Most recent 3-year design value &lt; 85% of any PM<sub>2.5</sub> NAAQS<sup>3,4</sup></b>
> 1M	3	2
500K – 1M	2	1
50K – 500K <sup>5</sup>	1	0

<sup>1</sup> Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

<sup>2</sup> Population based on latest available census figures.

<sup>3</sup> The PM<sub>2.5</sub> National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

<sup>4</sup> These minimum monitoring requirements apply in the absence of a design value.

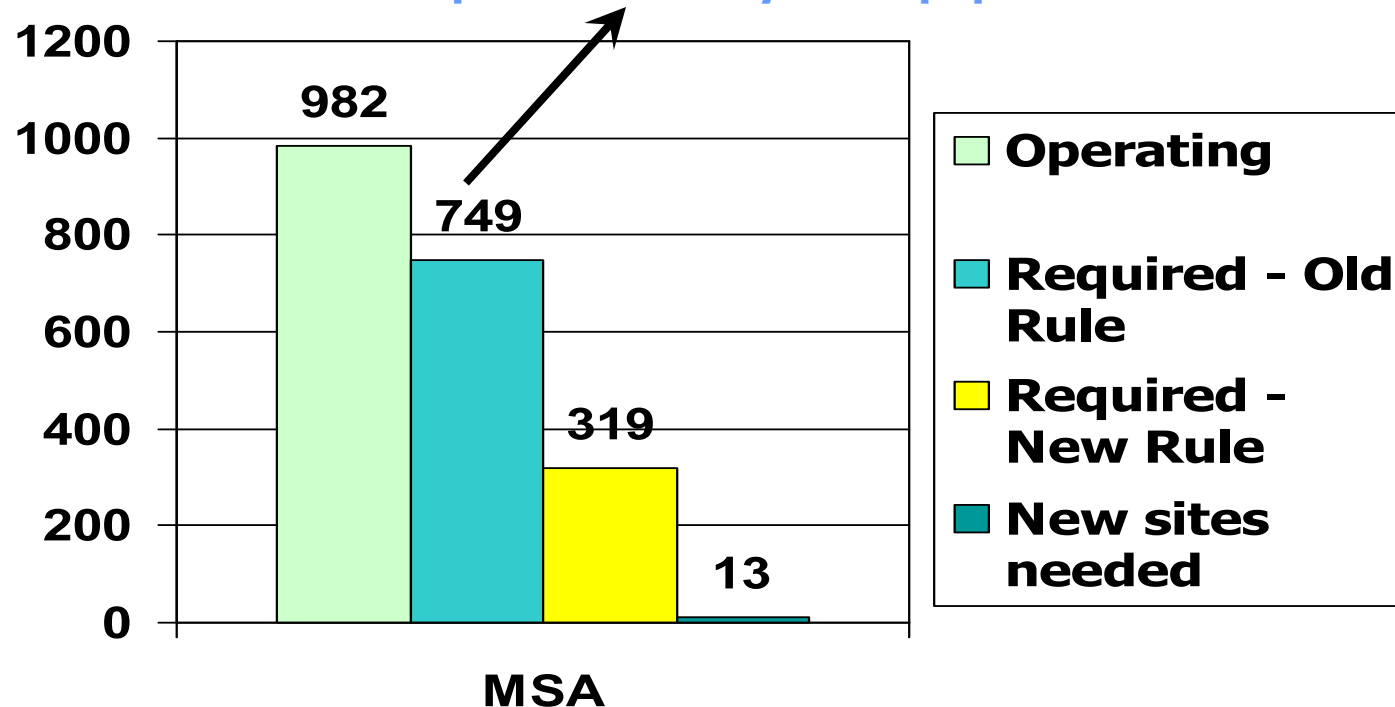
<sup>5</sup> Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

- At least one population oriented site in an area of maximum concentration and one site in an area of poor air quality (where more than 1 site required)
- Regional background and transport monitors required in each State – with flexibility to use IMPROVE or nearby States monitor
- Exemptions from monitoring requirements by Regional Administrator
- One half (rounded up) of required FRM/FEM samplers need continuous monitors (do not have to be collocated with FRM's)



# ***PM<sub>2.5</sub> FRM/FEM Monitoring Sites***

342 of 749 required for every 200K population outside of MSA's



Preamble: 71 FR 61240

*“EPA does not intend to encourage net reductions in the number of O<sub>3</sub> and PM<sub>2.5</sub> monitoring sites in the U.S. as a whole. The surplus in the existing networks relative to minimum requirements gives States more flexibility to choose where to apply monitoring resources for O<sub>3</sub> and PM<sub>2.5</sub>.”*

## ***Retain Existing $PM_{10}$ Minimum Monitoring Requirements\****

<b>MSA population</b>	<b>High Concentration<sup>2</sup></b>	<b>Medium Concentration<sup>3</sup></b>	<b>Low Concentration<sup>4</sup></b>
>1,000,000	6-10	4-8	2-4
500k – 1,000,000	4-8	2-4	1-2
250k – 500k	3-4	1-2	0-1
100k – 250k	1-2	0-1	0

\1\ Selection of urban areas and actual number of stations per area will be jointly determined by EPA and the State agency.

\2\ High concentration areas are those for which ambient  $PM_{10}$  data show ambient concentrations exceeding either  $PM_{10}$  NAAQS by 20 percent or more.

\3\ Medium concentration areas are those for which ambient  $PM_{10}$  data show ambient concentrations exceeding 80 percent of the  $PM_{10}$  NAAQS.

\4\ Low concentration areas are those for which ambient  $PM_{10}$  data show ambient concentrations less than 80 percent of the  $PM_{10}$  NAAQS.

\*  $PM_{10}$  concentrations corrected to standard temperature and pressure (STP)

# *Ozone Minimum Monitoring Network Requirements*

<b>MSA Population<sup>1,2</sup></b>	<b>Most recent 3-year design value <math>\geq</math> 85% of any O<sub>3</sub> NAAQS<sup>3</sup></b>	<b>Most recent 3-year design value &lt; 85% of any O<sub>3</sub> NAAQS<sup>3,4</sup></b>
> 10M	4	2
4 - 10M	3	1
350K – 4M	2	1
50K – 350K <sup>5</sup>	1	0

<sup>1</sup> Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

<sup>2</sup> Population based on latest available census figures.

<sup>3</sup> The ozone (O<sub>3</sub>) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

<sup>4</sup> These minimum monitoring requirements apply in the absence of a design value.

<sup>5</sup> Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

- At least one ozone site in each area's network must be designed to record the maximum concentration for that particular area.
- Deviations allowed by the Regional Administrator.

## ***Revocation of Minimum Monitoring Requirements: CO, SO<sub>2</sub>, NO<sub>2</sub>, Pb***

- Generally, for all of these pollutants the EPA Region can approve the shutdown of a monitor as part of the annual network review.
  - See 58.14 for specific provisions on discontinuing monitors.
  - Watch out for SIP commitments for specific monitors and/or contingency measures tied to monitoring triggers.
- No minimums apply for CO, SO<sub>2</sub>, NO<sub>2</sub>.
- Pb – required in areas where levels are still a concern.
  - 2 sites required in areas above the NAAQS.
    - 1 maximum exposure site
  - 10 Pb sites at NCore or urban air toxics sites for long-term trends; one per Region in most populated MSA/CSA.

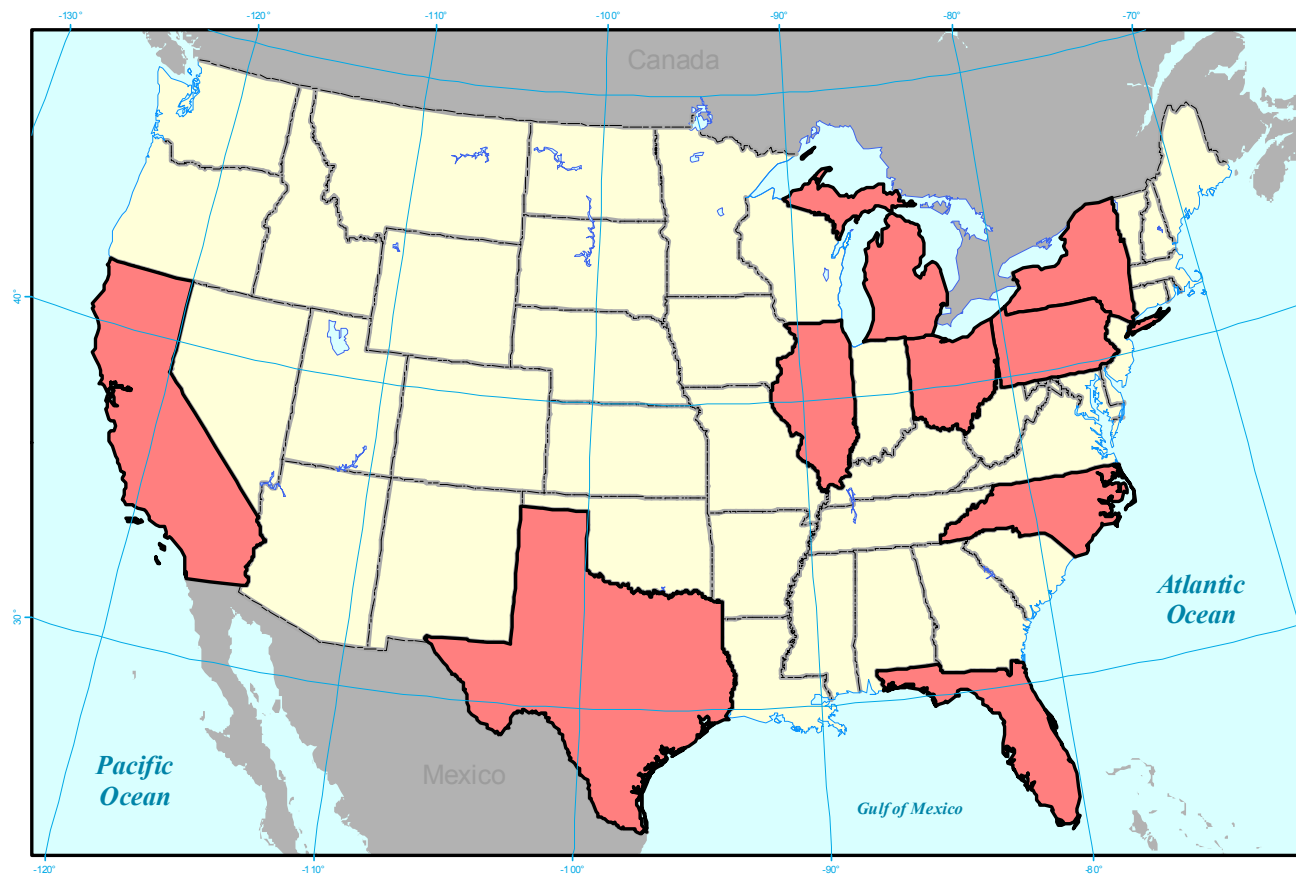
## ***New Monitoring Requirements: NCore Multi-Pollutant Network***

- Collocation of multiple pollutant and supporting measurements to meet many different objectives.
- Robust suite of filter-based PM samplers.
- Emphasis on continuous operating instruments.
- Use of high-sensitivity precursor gas monitors.
- Diversity of representative site locations.
- Leverage with existing multipollutant networks.
- Between 62 and 71 stations must be operational by January 1, 2011.



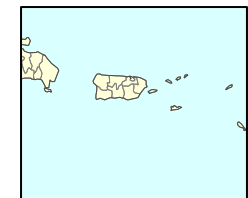
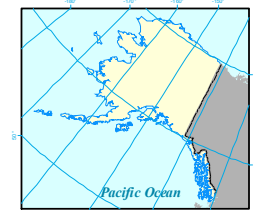
**Candidate NCore Site 361010003  
Pinnacle Park, New York**

## Minimum NCore Network Requirements



## 1 Site

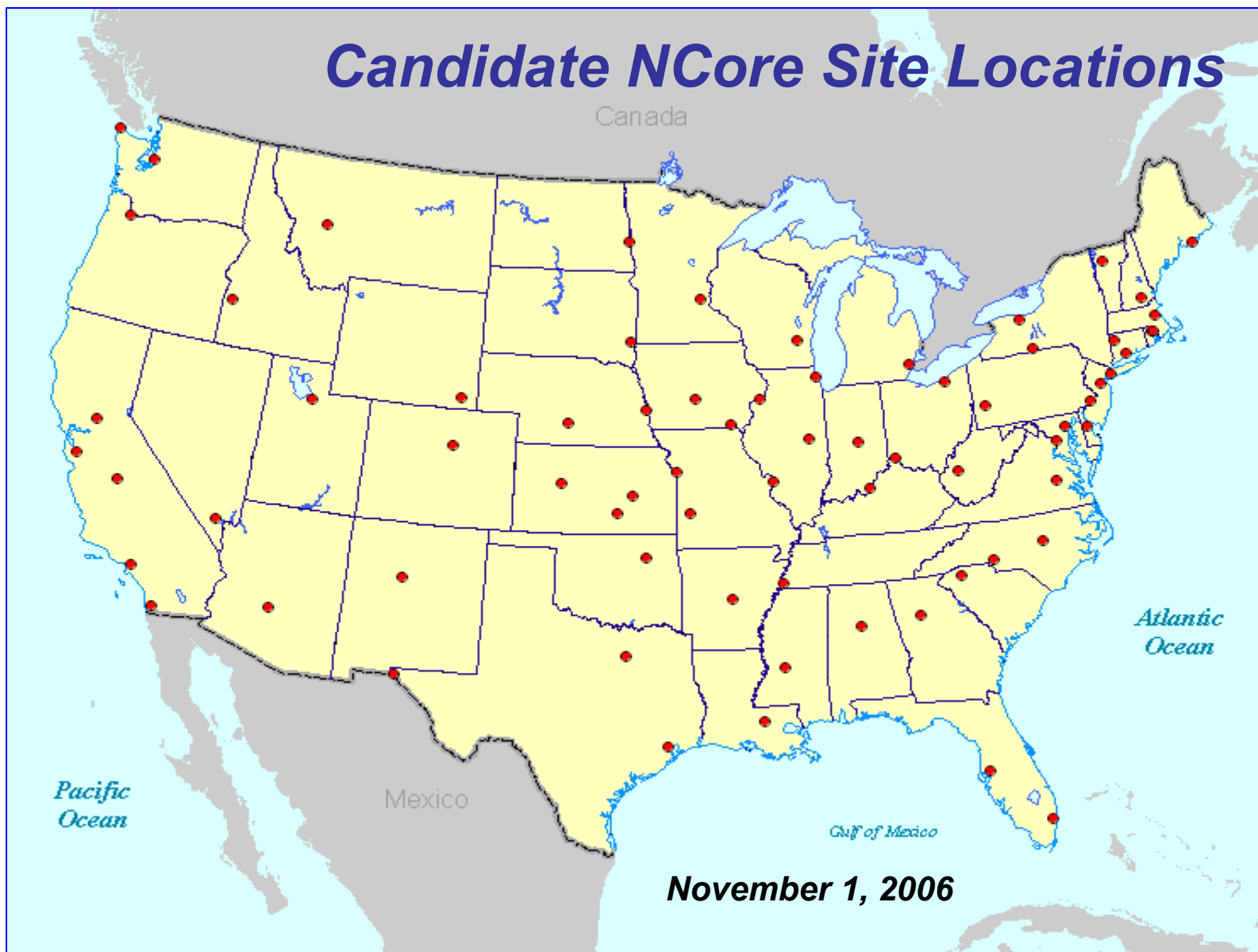
## 2 or 3 Sites



(All fifty States, District of Columbia, Puerto Rico, Virgin Islands)

## *Status Of NCore Pilot Program*

- We have information on approximately 70 existing and potential NCore site locations. Some of these sites have equipment in varying stages of installation and operation.
- Regions are negotiating with States about some of these locations. Final proposed NCore sites must be included in July 1, 2009 plan but earlier approvals would be optimal.
- OAQPS is developing an AMTIC-based web tool to help organize information about NCore sites and serve as an outreach tool for potential data users. How you can help:
  - Insure that all fields in AQS are completed for candidate sites.
  - Follow-up on data request sent through Regions last summer for GPS-obtained coordinates, site and cardinal direction photographs (8 sectors), currently operating parameters.
  - Please forward information to Kevin Cavender at:  
([cavender.kevin@epa.gov](mailto:cavender.kevin@epa.gov)) – (919)-541-2364.
  - Web tool should become available December 2006.





# Other Monitoring Requirements

## *AQS Data Submittal, Certification, and Archiving*

- Quarterly ambient data reporting remains the same – within 90 days past the end of the quarter.
  - SO<sub>2</sub>, CO, O<sub>3</sub>, NO<sub>2</sub>, NO, NO<sub>x</sub>, NO<sub>y</sub>, Pb, PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>10-2.5</sub>, chemical speciation, meteorological data for NCore and PAMS.
  - Reduced requirements for supplemental PM<sub>2.5</sub> records – only sampler-generated average temperature and barometric pressure.
  - More explicit reference to reporting of precision and accuracy data in §58.16.
- 6-month Data Reporting – past the end of the quarter.
  - VOC, and if collected, carbonyl, NH<sub>3</sub>, and HNO<sub>3</sub>
- New requirement for reporting field blank mass (micrograms) for PM<sub>2.5</sub> filter based FRM/FEMs
- Data certification deadline moved up from July 1st to May 1st, beginning in 2010 (for data collected in calendar year 2009).
- New requirement for archiving filters from low-volume PM<sub>10</sub> or PM<sub>10-2.5</sub> samplers (in addition to existing PM<sub>2.5</sub> requirement).

## *Special Purpose Monitors (SPM)*

- What is it/isn't it?
  - Site can be used for up to 24 months without being compared to NAAQS, (except violating monitors may be used for CO, SO<sub>2</sub>, NO<sub>2</sub>, and Pb when States request an existing non-attainment area be designated to attainment).
  - Designated in annual network plan and AQS.
  - Cannot be a monitor used to meet the minimum monitoring requirements.
  - Cannot be an existing SLAMS monitor, unless EPA approves the change.
- What applies to it?
  - Flexibility for network design, and probe and siting criteria.
  - QA and methods apply for FRM/FEM/ARM if site meets probe siting criteria; however, some QA requirements can be waived when logistically infeasible due to unusual site conditions and not essential to the monitoring objective.
  - Data submitted to AQS for FRM/FEM/ARM.
- Other
  - No prior approval needed to shut down an SPM.

## ***Network Plans and Assessments***

- Annual Monitoring Network Plans
  - First one due July 1, 2007
    - “...must be made available for public inspection at least 30 days prior to submission to EPA.”
    - Approved by the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove within 120 days (can be waived based on certain conditions).
- Air Quality Assessments every five years
  - Comprehensive in scope, more complete evaluation of monitoring objectives, new technologies.
  - First one due July 1, 2010.
  - Draft guidance available at:
    - <http://www.epa.gov/ttn/amtic/files/ambient/criteria/nettech.pdf>

## *Other Monitoring Rule Changes*

- PAMS Monitoring Program
  - Currently 109 stations in 25 Ozone non-attainment areas.
  - New requirements represent a reduction to about half the existing requirements.
  - Allows PAMS programs to be more customized to local data needs.
    - Recommend keeping air toxics data users in mind if there are any reductions.
- Probe Siting
  - Increased set-back distances from roadways for new ozone sites.
  - Finalized middle-scale PM<sub>10-2.5</sub> height requirement.

# Important Dates in the Monitoring Rule

## ***Effective in 60 Days from Federal Register Printing - (December 18, 2006)***

- New criteria for approval of Federal Equivalent Methods for PM<sub>2.5</sub> and PM<sub>10-2.5</sub>, and Approved Regional Methods.
- New QA requirements for SLAMS.
- New required numbers of PM<sub>2.5</sub>, PM<sub>10</sub>, Pb, and ozone monitors by MSA, if lower than old.
- Removal of required numbers for CO, SO<sub>2</sub>, and NO<sub>2</sub> (except if in SIP).
- Criteria for removal of monitors above required number.
- Conditions on use of SPM data.
- Removal of required reporting of certain PM<sub>2.5</sub> monitoring parameters.
- PM<sub>10-2.5</sub> probe heights.
- Increased distance between roadways and NEW ozone monitors.

## *Effective January 1, 2007*

- Every day  $PM_{2.5}$  samples at about 50 stations reading close to the new 24-hour standard.
- Retention of low-volume  $PM_{10}$  and  $PM_{10-2.5}$  filters.
- Reporting of blank filter data to AQS.
- Last chance to convert excess SLAMS to SPM status, without first meeting criteria for discontinuation.



## *Effective July 1, 2007*

- Precision and accuracy data for Q1 of 2007 must be submitted to AQS.
  - Not an explicit requirement in old rule, not all monitoring organizations have been reporting it.
- Annual monitoring plan.
  - A current requirement, but double check required content.
  - Including plans for any additional required PM<sub>2.5</sub>, PM<sub>10</sub>, or ozone monitors under new required numbers of monitors by MSA.

## *120 Days After Annual Plan Submittal*

- Regional Administrator must approve/disapprove the annual plan.
  - Requires public comment, if the State did not provide a comment process.
  - Some changes, if in plan, require Administrator approval.
    - OAQPS will make recommendations on possible delegation of some of these decisions to headquarters staff-level.

## *Effective January 1, 2008*

- Start operation of any new required PM<sub>2.5</sub>, PM<sub>10</sub>, or ozone monitors.
  - About 13 new PM<sub>2.5</sub> monitors.
  - Any additional ozone monitors.
  - PM<sub>10</sub> monitors in approximately 8 MSAs.

## *Effective January 1, 2009*

- New QA requirements apply to Special Purpose Monitoring stations using FRM, FEM, or ARM monitors.
  - Regional Administrator can approve an alternative for practicality reasons, if full QA not essential to monitoring objective.
  - Alternative QA plan means data not comparable to the NAAQS.

## ***Effective July 1, 2009***

- Plan for required NCore stations.

## ***Effective May 1, 2010***

- Revised deadline for annual certification of data submitted to AQS.

## ***Effective July 1, 2010***

- First 5-year network assessment.

## ***Effective January 1, 2011***

- Operation of NCore stations.

# **Important Quality Assurance Aspects and Related Guidance of the Monitoring Rule**

Mike Papp

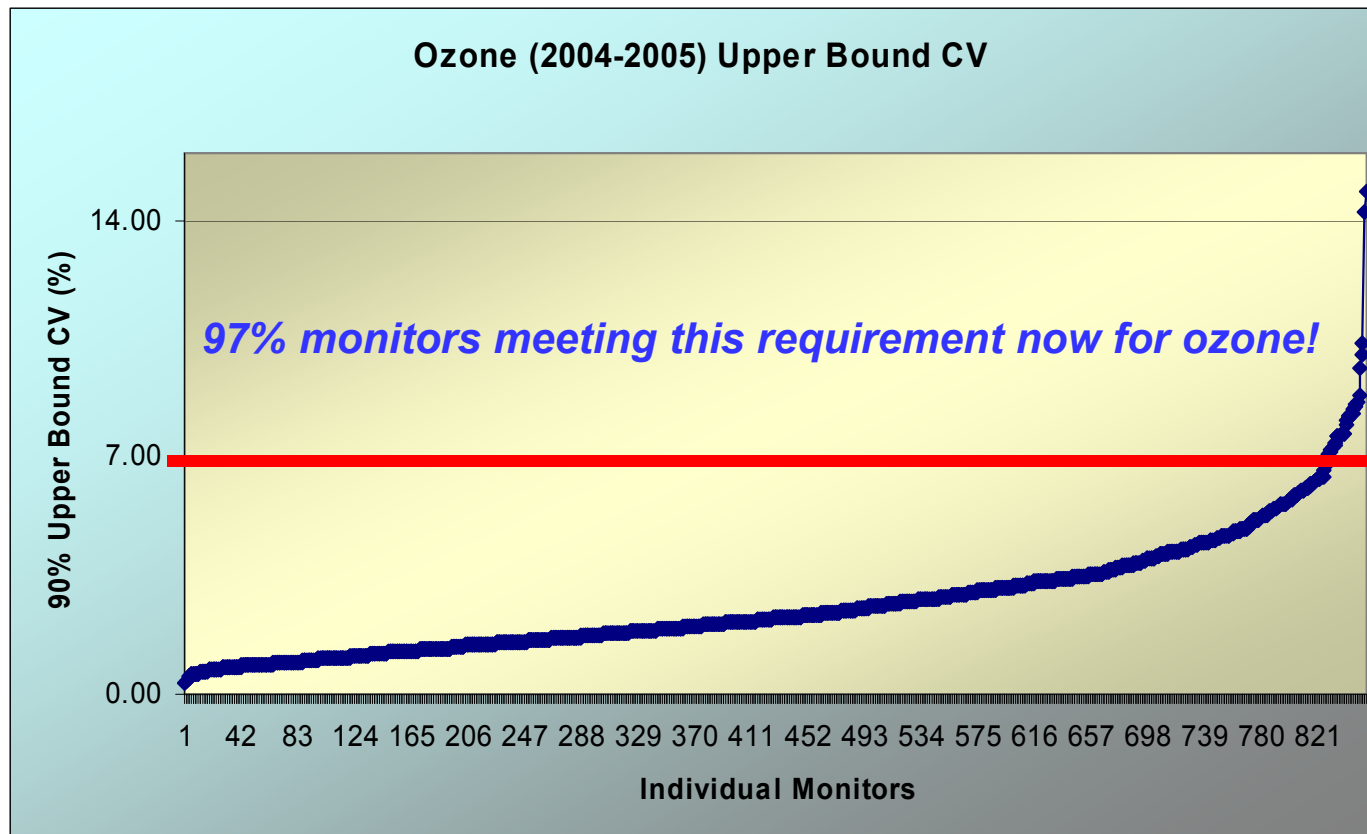
November, 2006 National Ambient Air  
Monitoring Conference  
Las Vegas, NV

# Changes in the QA Regulations (40 CFR Part 58 Appendix A)

- Ensured regs reflected current EPA QA policy and requirements
- Combined Appendix A and B (PSD)
- Removed SO<sub>2</sub>/NO<sub>2</sub> manual audit checks (development of audit solutions)
- Established DQOs for PM<sub>10-2.5</sub> and O<sub>3</sub>
  - Measurement quality objectives (MQOs) changing for gaseous pollutants

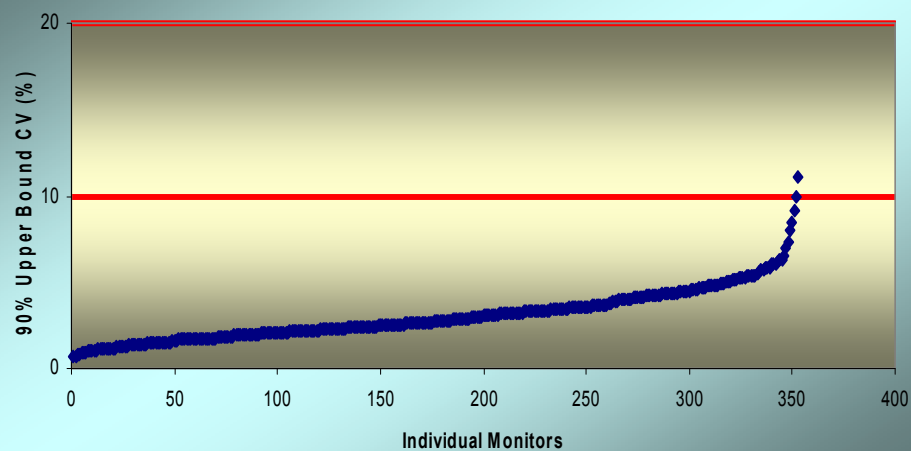
# MQOs for Gaseous Pollutants Will Change

- Ozone to 7% CV +/- 7% Bias
- Other gases will be changed to 10% in Guidance

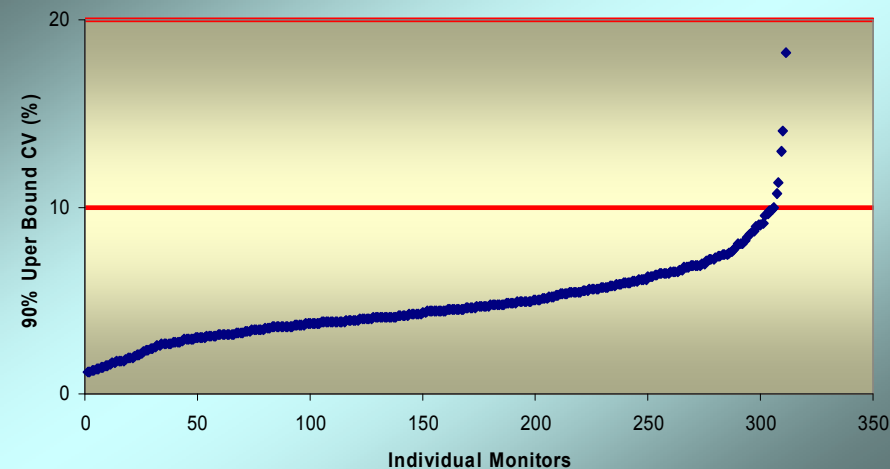




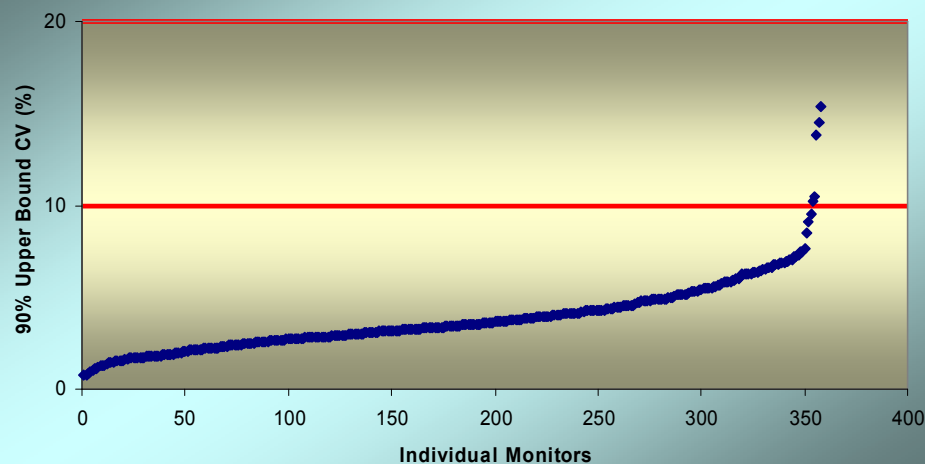
Carbon Monoxide (2004-2005) Upper Bound CV



NO<sub>2</sub> (2004-2005) Upper Bound CV



SO<sub>2</sub> (2004-2005) Upper Bound CV



# Changed Term “Reporting Organization” to “Primary Quality Assurance Organization”

- Can reduce PM QA Implementation Burdens
- Will retain “reporting organization” role for another use
- In most cases RO will equal PQAO
- NADG will work to reduce burdens of adding this new role in AQS

Old Rule (before 9/27/06)	New Rule
<p>3.0.3 Each reporting organization shall be defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogeneous, as a result of common factors.</p> <p>(a) Common factors that should be considered by in defining reporting organizations include:</p> <ol style="list-style-type: none"> <li>(1) Operation by a common team of field operators</li> <li>(2) Common calibration facilities.</li> <li>(3) Oversight by a common quality assurance organization.</li> <li>(4) Support by a common laboratory or headquarters.</li> </ol>	<p>3.1.1 Each <a href="#">primary quality assurance organization</a> shall be defined such that measurement uncertainty among all stations in the organization can be expected to be reasonably homogeneous, as a result of common factors. Common factors that should be considered by monitoring organizations in defining <a href="#">primary quality assurance organizations</a> include:</p> <ol style="list-style-type: none"> <li>(a) Operation by a common team of field operators <a href="#">according to a common set of procedures</a>;</li> <li>(b) <a href="#">Use of a common QAPP or standard operating procedures</a>;</li> <li>(c) Common calibration facilities <a href="#">and standards</a>;</li> <li>(d) Oversight by a common quality assurance organization; and</li> <li>(e) Support by a common <a href="#">management</a>, laboratory or headquarters.</li> </ol>

# Expanded audit concentration levels for precursor gas monitoring

*"The evaluation is made by challenging the analyzer with audit gas standard of known concentration (effective concentration for open path analyzers) from at least three consecutive **audit levels**. The **audit levels selected should represent or bracket 80 percent of ambient concentrations** that are **measured by the analyzer being evaluated**. An additional 4th level is encouraged for those monitors that have the potential for exceeding the concentration ranges described by the initial three selected."*

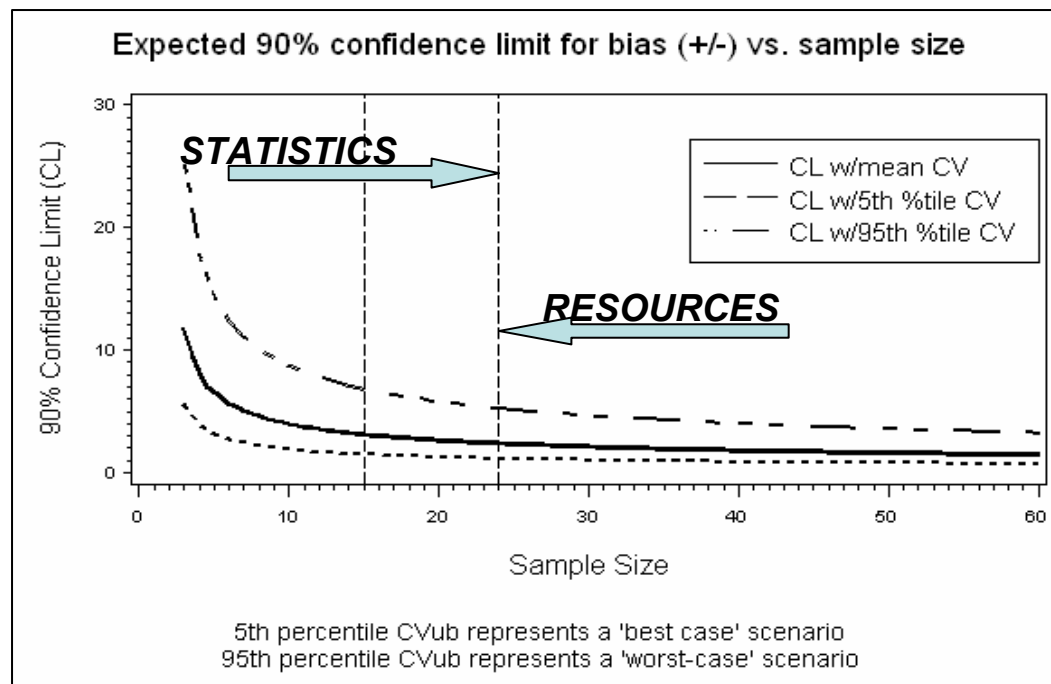
Audit level	Concentration range, ppm			
	O <sub>3</sub>	SO <sub>2</sub> ,	NO <sub>2</sub>	CO
1 . . . . .	0.02-0.05	0.0003-0.005	0.0002-0.002	0.08-0.10
2 . . . . .	0.06-0.10	0.006-0.01	0.003-0.005	0.50-1.00
3 . . . . .	0.11-0.20	0.02-0.10	0.006-0.10	1.50-4.00
4 . . . . .	0.21-0.30	0.11-0.40	0.11-0.30	5-15
5 . . . . .	0.31-0.90	0.41-0.90	0.31-0.60	20-50

## PM QA Regulation Changes and Related Burdens

Method	Coverage	Minimum Frequency Old Rule	Minimum Frequency New Rule	Net Effect
<b>Automated Methods</b>				
<b>Flow rate verification</b> PM <sub>2.5</sub> , PM <sub>10-2.5</sub> PM <sub>10</sub>	Each sampler Each sampler	Once every 2 weeks Once every 2 weeks	Once every month Once every month	Decrease 12/unit Decrease by 12/unit
<b>Flow rate audit</b> PM <sub>2.5</sub> , PM <sub>10-2.5</sub> PM <sub>10</sub>	Each sampler Each Sampler	Once every Quarter Once every year	Once every 6 months Once every 6 months	Decrease by 2 per unit Increase by 1 per unit
<b>Collocated Sampling</b> PM <sub>2.5</sub> , PM <sub>10-2.5</sub>	15%	Every 6 days	Every twelve days	Decrease by 30 per collocated unit
<b>Performance Evaluation Program (PEP)</b> PM <sub>2.5</sub> , PM <sub>10-2.5</sub>	See rule	25% of method designations 4 times per year	1. 5 valid audits for primary QA orgs, with ≤ 5 sites 2. 8 valid audits for primary QA orgs, with > 5 sites	Decrease in overall national audits by ~25%
<b>Manual Instruments</b>				
<b>Collocated Sampling</b> PM <sub>10-2.5</sub> , PM <sub>2.5</sub> PM <sub>10</sub> , TSP	15%	Every 6 days	Every 12 days	Decrease by 30 per collocated unit
<b>Flow rate verification</b> PM <sub>10-2.5</sub> , PM <sub>2.5</sub> PM <sub>10</sub> , TSP	Each sampler	Once every month No verification	Once every month Once every quarter** (Changed)	No Change Increase of 4 per unit
<b>Flow rate audit</b> PM <sub>10-2.5</sub> , PM <sub>2.5</sub> PM <sub>10</sub> , TSP	Each sampler Each sampler	Once every Quarter Once every year	Once every 6 months Once every 6 months	Decrease by 2 per unit Increase by 1 per unit
<b>Manual Methods</b> Lead	1. Each sampler 2. Analytical system	1. Include with TSP 2. Each quarter	1. Include with TSP 2. Each quarter	No Change
<b>Performance Evaluation Program</b> PM <sub>2.5</sub> , PM <sub>10-2.5</sub>	See rule	25% of method designations 4 times per year	1. 5 valid audits for primary QA orgs, with ≤ 5 sites 2. 8 valid audits for primary QA orgs, with > 5 sites	Decrease in overall national audits by ~25%

# PM<sub>2.5</sub> Performance Evaluation Program (PEP) Reduction

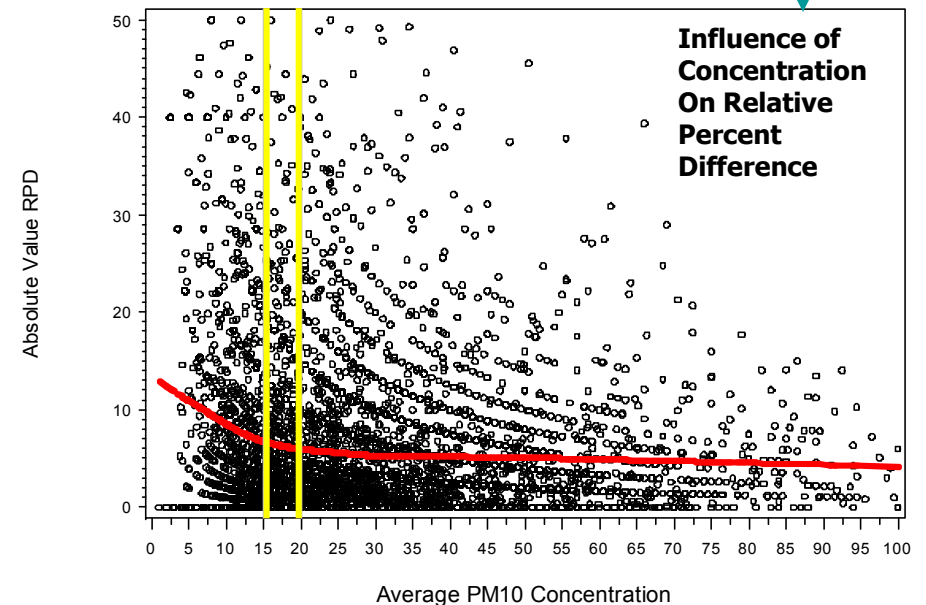
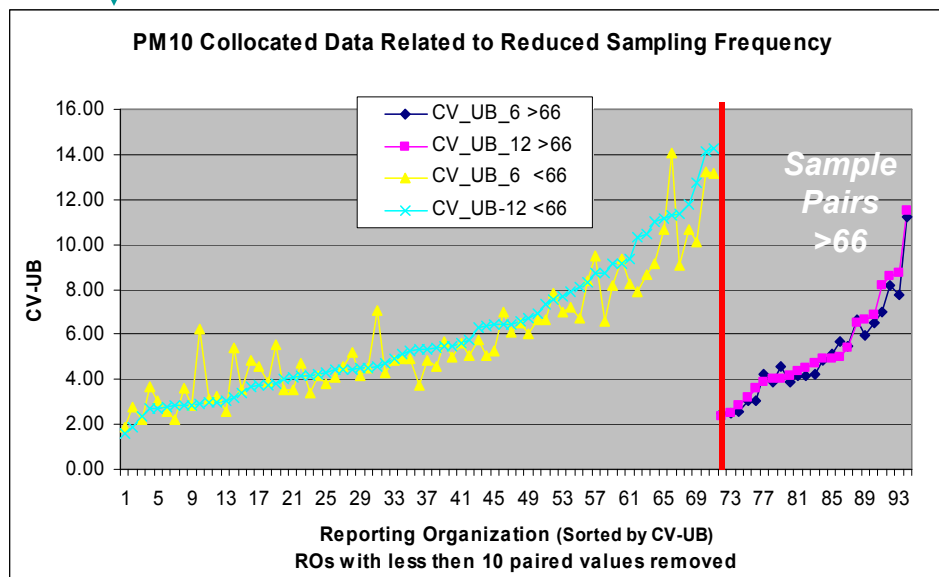
- From 25% of sites 4 times a year to:
  - 5 audits for PQAOs with  $\leq 5$  sites (15 over 3 years)
  - 8 audits for PQAOs with  $> 5$  sites (24 over 3 years)



# PM Collocation Reductions/Changes



- Number of sites 25% to 15%
- Sampling frequency 1-in-6 days to 1-in-12 days
- Reduced cutoff values
  - From 20 ug/m<sup>3</sup> to 15 ug/m<sup>3</sup> for PM<sub>10</sub>
  - From 6 ug/m<sup>3</sup> to 3 ug/m<sup>3</sup> for PM<sub>2.5</sub>
- Modified PM<sub>10-2.5</sub> requirement since fewer sites are expected



# Revised PM<sub>10-2.5</sub> Collocation Requirements

- Since PM<sub>10-2.5</sub> NAAQS not promulgated, only NCore stations have to measure PM<sub>10-2.5</sub>
  - Too few per PQAQO to require collocation at PQAQO level of aggregation
- Goal is 15% of each method (FRM/FEM) in network
  - Regional Administrator makes decision
  - Start with PQAQOs with more than one PM<sub>10-2.5</sub> site
  - PM<sub>10-2.5</sub> collocation can count towards PM<sub>10</sub> and PM<sub>2.5</sub> collocation requirements.

# Flow Rates

- Standardized PM monitoring flow rate audit and verification frequencies
  - Automated Methods
    - Reduced PM2.5 audit requirements but increased PM10
    - Reduced PM10 and PM2.5 verification requirements
  - Manual Methods
    - Decreased PM2.5 audit requirement but increased PM10
    - No Change to PM2.5 verifications but increased PM10



# PM QA Regulation and Related Burdens



Pollutant	Method	# Sites	Flow Verification Decrease /Increase	Flow Audit Decrease /Increase	Collocated Sampling Decrease /Increase	PEP Decrease /Increase
PM10	Continuous	123	-1722	123	NA	NA
PM10	Manual	642	2568	642	-4080	NA
PM2.5	Continuous	180	-2520	-360	-1680	0
PM2.5	Manual	937	NC	-1874	-5220	-314
TSP/Pb	Manual	100	400	100	-1050	NA
<b>Total</b>	<b>(w/o 2.5 continuous)</b>	<b>1802</b>	<b>1246</b>	<b>-1009</b>	<b>-10410</b>	<b>-314</b>
<b>Total</b>	<b>(with 2.5 continuous)</b>	<b>1982</b>	<b>-1274</b>	<b>-1369</b>	<b>-12090</b>	<b>-314</b>

If monitoring organizations discontinue some PM10 stations as envisioned in the draft monitoring strategy, additional QC reductions would be expected.

# Revised Performance Evaluation Language of PEP and NPAP

- Monitoring organization responsible for implementing adequate and independent audit
  - Allows for continued Federal implementation with STAG Funds
  - Regions/OAQPS will agree on adequacy and independence criteria
  - Regions will accept monitoring organizations programs based on criteria



# Adequate NPAP/PEP (abridged version)

## NPAP

- Performing audits at a risk-targeted 20% of monitoring sites/instruments
- Data submission to AQS
- TTP Delivery system
- Follow NPAP field/lab SOP critical performance criteria
- Use of audit gasses that are NIST certified and validated at least once a year
- Validation/certification with the EPA NPAP program
- Incorporated in QAPP

## PEP

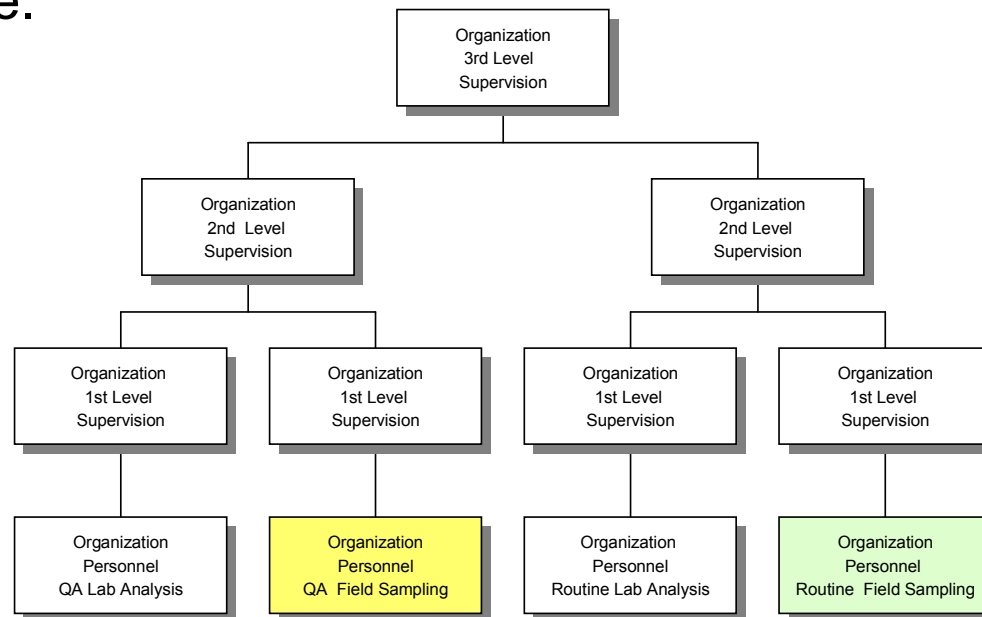
- Valid audits of 5 or 8 per PQAO per year
- Data submission to AQS
- Use of independent personnel, sampling devices (FRMs) weighing laboratory and standards
- Follow PEP field/lab SOPs critical performance criteria
- Follow PEP validation criteria
- Validation/certification with the EPA PEP program
- Incorporated into QAPP

# Independence PEP/NPAP

- Not part of the organization directly performing and accountable for the work being assessed.
- A management structure that allow for the separation of its routine sampling personnel from its auditing personnel by two levels of management
- Submission of a plan demonstrating independence to the EPA Regional Office.

**For PEP, labs must also be independent.**

**Region 4 contractor Operated PEP Lab is available (STAG Funds required) as well as others.**



# NPAP/PEP Implementation Scenario

- **May 17, 2006-** FY07 PEP/NPAP Implementation Memo to SLTs
  - Provided options for FY07 and requested statement of intentions by **July 15, 2006**.
    - 1 new monitoring organization (NY) opting for PEP
    - 3 new monitoring organizations opting for NPAP (NY, TX, FL)
  - Those demonstrating capabilities by **Sept. 30**, would have STAG funds returned ASAP
- Similar memo generated each year (**Jan**) for monitoring organization decision

# New Statistics



Region	State	Agency	Site	CFR Lower Limit	CFR Upper Limit	Bias UB	CV UB
01	CT	0251	090010017	NA	NA	-2.17	0.77
01	CT	0251	090011123	NA	NA	4.15	4.88
01	CT	0251	090013007	NA	NA	-4.35	2.17
01	CT	0251	090019003	NA	NA	2.98	3.13
01	CT	0251	090031003	NA	NA	1.62	1.92
01	CT	0251	090070007	NA	NA	-3.95	1.96
01	CT	0251	090090027	NA	NA	0.60	0.84
01	CT	0251	090093002	NA	NA	-3.75	1.98
01	CT	0251	090110008	NA	NA	2.11	2.52
01	CT	0251	090131001	NA	NA	-4.04	1.22
01	CT	0251	All - NSP	-6.72	+3.53	-2.73	2.77
01	MA	0660	250010002	NA	NA	-1.61	1.35
01	MA	0660	250034002	NA	NA	+1.80	1.52
01	MA	0660	250051002	NA	NA	-2.99	0.61
01	MA	0660	250092006	NA	NA	-4.49	4.14
01	MA	0660	250094004	NA	NA	3.50	4.41
01	MA	0660	250095005	NA	NA	-1.64	1.9
01	MA	0660	250130008	NA	NA	1.73	2.11
01	MA	0660	250150103	NA	NA	+2.64	1.85
01	MA	0660	250154002	NA	NA	-4.84	2.14
01	MA	0660	250171102	NA	NA	-1.31	0.49
01	MA	0660	250213003	NA	NA	-1.32	1.13

- Changed Statistics (forms and levels of aggregation)
  - Confidence limits
    - PQAQ for PM
    - Site level for gaseous pollutants
  - AMP255 Report performs new statistics
    - Performing in-depth review of Stats this year
    - OAQPS will run annually
    - Box-and-whisker plots included in annual summary
  - Guidance document in development
    - Rationale and excel spreadsheet

<http://www.epa.gov/ttn/amtic/parslist.html>

**DASC (Data Assessment Statistical Calculator)**

Site: {Enter Site ID or Name Here}

# P&B Guidance and Data Assessment Statistical Calculator (DASC) Software

## Gaseous Assessments

<b>Step 1</b> <b>Pick a Pollutant</b> <b>Automated Methods</b> <input checked="" type="checkbox"/> SO2 <input type="checkbox"/> NO2 <input type="checkbox"/> O3 <input type="checkbox"/> CO <input type="checkbox"/> PM 2.5 <input type="checkbox"/> PM10 <input type="checkbox"/> PM 10-2.5  <b>Manual Methods</b> <input type="checkbox"/> PM 2.5 <input type="checkbox"/> PM 10 <input type="checkbox"/> PM 10-2.5 <input type="checkbox"/> Lead	<b>Step 2</b> <b>Pick a Statistic to Calculate</b> <input checked="" type="checkbox"/> Precision Estimate <input type="checkbox"/> Bias Estimate <input type="checkbox"/> Absolute Bias Estimate <input type="checkbox"/> Semi-Annual Flow Rate <input type="checkbox"/> One-Point Flow Rate
<b>Step 3</b> <input type="button" value="Go To Worksheet"/>	

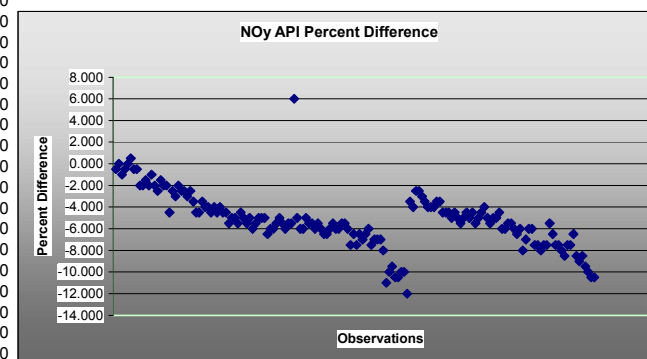
Site ID: Burdens		Pollutant type: NOy API		CV_ub (%)		Bias (%)	
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d_sqrd	d_abs	d_abs ^2	
19.9	20	-0.500	-6.500	0.250	0.500	0.250	
20	20	0.000	75th Percentile	0.000	0.000	0.000	
19.8	20	-1.000	-4.000	1.000	1.000	1.000	
19.9	20	-0.500		0.250	0.500	0.250	
20	20	0.000		0.000	0.000	0.000	
20.1	20	0.500		0.250	0.500	0.250	
19.9	20	-0.500		0.250	0.500	0.250	
19.9	20	-0.500		0.250	0.500	0.250	
19.6	20	-2.000		4.000	2.000	4.000	
19.6	20	-2.000		4.000	2.000	4.000	
19.7	20	-1.500		2.250	1.500	2.250	
19.6	20	-2.000		4.000	2.000	4.000	
19.8	20	-1.000		1.000	1.000	1.000	
19.6	20	-2.000		4.000	2.000	4.000	
19.5	20	-2.500		6.250	2.500	6.250	
19.7	20	-1.500		2.250	1.500	2.250	
19.6	20	-2.000		4.000	2.000	4.000	
19.6	20	-2.000		4.000	2.000	4.000	
19.1	20	-4.500		20.250	4.500	20.250	
19.5	20	-2.500		6.250	2.500	6.250	
19.4	20	-3.000		9.000	3.000	9.000	
19.6	20	-2.000		4.000	2.000	4.000	
19.5	20	-2.500		6.250	2.500	6.250	
19.5	20	-2.500		6.250	2.500	6.250	
19.4	20	-3.000		9.000	3.000	9.000	
19.5	20	-2.500		6.250	2.500	6.250	
19.3	20	-3.500		12.250	3.500	12.250	
19.1	20	-4.500		20.250	4.500	20.250	
19.1	20	-4.500		20.250	4.500	20.250	
19.3	20	-3.500		12.250	3.500	12.250	
19.2	20	-4.000		16.000	4.000	16.000	
19.2	20	-4.000		16.000	4.000	16.000	
19.1	20	-4.500		20.250	4.500	20.250	
19.2	20	-4.000		16.000	4.000	16.000	

n	st dev(d)	st dev (d^2)	sum(d_abs)	"AB" (Eqn 3a)
162	2.544	27.349	863.500	5.330
n-1	sum(d)	sum(d^2)	sum(d_abs^2)	"AS" (Eqn 3b)
161	-850.500	5507.250	5507.250	2.370

<b>Bias (%) (Eqn 3)</b>	Both Signs Positive
5.64	FALSE
<b>Signed Bias (%)</b>	Both Signs Negative
-5.64	TRUE

**CV (%) (Eqn 2)**  
2.74

<b>Upper Probability Limit</b>	<b>Lower Probability Limit</b>
-0.26	-10.24





## Box-&-Whisker O3 Data from Two States

<http://www.epa.gov/ttn/amtic/parslist.html>

